THE MÜTTER LECTURES ON SELECTED TOPICS IN SURGICAL PATHOLOGY.

SERIES OF 1890-1.[1]

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LECTURE X.

MIXED AND SECONDARY INFECTIONS.

(CONTINUED)

SYLLABUS.—Mixed and Secondary Infection Complicating Erysipelas; Lymphangitis; Variola; Cerebro-spinal meningitis; Infectious pseudo-rheumatism; Infectious endocarditis, Erythema multiforme; Tuberculosis; Glanders; Anthrax; Syphilis; Gonorrhœa; The puerperal state; Other genito-urinary lesions.

ERYSIPELAS.

AMONG the earliest authors to describe the supervention of rheumatoid inflammation during erysipelas, was Trousseau, who regarded them as agreeing in this respect that their symptoms were metastatic, and were, after a fashion, interchangeable. In other words, that the one could, as it were, take the place of the other, or that they could co-exist; and then he speaks of a young man suffering from facial erysipelas, who was suddenly seized with rheumatic pains, who had often suffered from the former, and who, since the accession of the latter had developed an endocardial murmur, most all of whose

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joints, even the smaller ones, were involved and who was a very sick man. As in the case of dysentery, the endeavor has been made to regard erysipelas as an external manifestation of rheumatism. Perroud was especially responsible for this view, and he found some reason for it in the frequent occurrence of a coincident cardiac affection; but this view has now no value, although it is well recognized that endocarditis is a frequent complication of erysipelas. That there is a form of rheumatoid arthritis consecutive to erysipelas we must accept, but it appears to have nothing except locality in common with a much more severe and disastrous joint lesion in the shape of pyarthrosis. It is impossible to disregard the biological fact that the specific parasitic agent in producing erysipelas, as in infectious endocarditis, is one of the well-known pyogenic streptococci. For a more definite reference to this organism and its proper position among other organisms, we must refer back to Lecture III. When we remember how common it is to have a superficial abscess or how, not infrequently, we have to deal with severer phlegmonous forms, we certainly ought to be genuinely surprised that so seldom we have to deal with the presence of pus in the bones or joints, or even in the nodes. For these cases we have scarcely to invoke the theory of a secondary or mixed infection, since we consider the streptococci of erysipelas of themselves sufficient to produce pus, although such is by no means their invariable action. Indeed the frequency with which positively distinct and undoubted manifestations of erysipelas occur, from which the specific organism can be readily cultivated, and yet without formation of a drop of discoverable pus, forms about the only argument in favor of a biological distinction between the streptococcus erysipelatis, and the streptococcus pyogenes.

Musgrave appears to have been the first to notice the coincidence between erysipelas and arthritis, and in 1709, in a work upon abnormal arthritism he mentions erysipelas as among the accidents which may determine this condition. Lorry speaks in the same sense. Joseph Frank mentions an arthritic erysipelas. Profeta classifies erysipelas among the symptomatic dermatoses of rheumatism and gout, and Pierre Frank, of Palermo, thought that suppressed gout might reappear in the

form of different cutaneous affections, particularly in that of erysipelas. Of course all these views are now attributable to the ignorance of that age concerning the nature of the disease, which was then considered as an ordinary dermatitis.

While of course its infectious character is everywhere recognized to-day the history of the disease shows that its contagiousness was suspected by Lorry in 1777, and definitely and forever established by Velpeau and Trousseau.

It is only proper also to make a distinction between cases where there has been a direct extension from the skin to the underlying synovial membrane, these being analogous to those where the disease spreads from the scalp to the meninges, or from the skin to the peritoneum, and those implications of joints which are at a distance from the part involved in the cutaneous manifestation. For instance Despres has described the case of a patient who had undergone an operation for cataract subsequent to which a violent erysipelas of the face developed. In this case pus was found in remote joints. Lawrence, Avery and Velpeau have noted the same distinction, and Volkmann mentions multiple pyarthroses which he separates sharply from embolic pyaemia, since they lack the clinical features of chills, temperature curves and other signs which genuine pyæmic cases present. When the disease is the result of direct extension, the prognosis is better than when it is of the latter general character. During the last Franco-German war a large number of patients in the Berlin barracks who had suffered from gun-shot fractures were seized with erysipelas, in consequence of which many of them died, sometimes of the disease itself, sometimes of a final pneumonia. Among 130 of these well marked cases, pus was found five times in the interior of the joints, over which the erysipelatous inflammation had spread. When we remember the anatomical fact that the joint cavities are practically enormous lymph spaces, it will be less difficult to appreciate the course of events in such cases as these. In other words, we have to deal first probably with a serous arthritis while the infection with pyogenic cocci is the secondary result.

Such a case as the following reported by Breusing is quite suggestive: An old man suffered from fracture of the neck o

the femur; after a while he developed an erysipelatous affection in the sacral region, which wandered down the left leg and in five days spread over the left knee; in twelve days he died. At the autopsy pus was found in this knee which connected with external bursae. Cultures made from the serous exudate taken from this same knee a week previous to the death proved to be pure cultures of Fehleisen's coccus.

In a clinical study concerning surgical infectious diseases, published in 1890 in Munich, by Fessler, he reports that an inoculation with a mixed culture of bacillus prodigiosus and streptococcus of erysipelas seems to produce more violent reaction upon the rabbit's ear than does the streptococcus alone, the reaction even proceeding to gangrene. It is not at all unlikely that some of the phlegmonous manifestations of erysipelas may be due to mixed infection after this fashion, although not necessarily with the bacillus spoken of here.

LYMPHANGITIS.

Verneuil, in a memoir read before the Academy in 1878, reported five cases in which a lymphangitis of the lower limb was followed by an arthritis or a hydrathosis of the knee. In one of these cases the collection of pus was so large and the phenomena so grave that amputation was proposed but refused. Drainage was then made, with antiseptic injections, but the patient died in a very short time, and at the autopsy the cartilages were found destroyed and the spongy bone saturated with pus. This patient entered the hospital suffering from some undetermined fibromatous condition with a gangrenous area on the back of the foot. Perhaps this is scarcely a typical case of its kind, since septic organisms had ready access from the necrotic area. On the other hand it is almost impossible to conceive of a lymphangitis not of microbic origin. Consequently it may stand, after all, as a specimen of its class.

VARIOLA.

But little is said in recent literature concerning the development of serious lesions of a surgical character consecutive to

small-pox. A large amount of what little has appeared upon it is met with in the writers of the early part of this century, about the latest distinct contribution to the subject being that of Bidder, relative to an epidemic of small-pox in Halle during 1870 and 1871, as the result of which several patients with purulent collections in and about the joints presented themselves in Volkmann's clinic. Here again, as was so universal, we find the same confusion of all obscure forms of joint trouble with rheumatic affections. Thus Brouardel mentions that he saw rheumatoid affections five times among 389 patients; they appeared during the stage of desquamation and he was able to convince himself that there was no pus present. An observation of Friedheim's, made during 1885, is of very great value. It concerns a boy, æt. 12, who was seized with small-pox, who, after it had disappeared, complained of violent pains and disability of the left arm and of the left hip. Even upon the next day it appeared as if the head of the humerus could be almost lifted out of its socket; there was no fluctuation; the left leg was strongly flexed upon the abdomen, and adducted. The trochanter was 4 cc above its normal position. Extension was applied. The spontaneous dislocation was reduced and the patient finally recovered.

The only joint manifestations of interest during the course of this disease are the arthropathies. Thus Rilliet and Barthez say that they have often observed a circumscribed phlegmasia about the joints, which were swollen, red and painful, resembling rheumatism in many respects. The inflammation involves one joint and passes rapidly to another, or it involves several at the same time, and then disappears after a few days, leaving no trace behind. Brouardel is rather of the opinion that this is a genuine rheumatism, since the periosteum of the long bones is often involved, and since endocarditis sometimes occurs. But a true suppurative arthritis involving several joints is common, and sometimes, according to Bidder, fragments of bone are evacuated, after which the joint recovers. These accidents occur most commonly during the period of drying up of the pustules or during convalescence.

Concerning the nature of these sequelæ Rilliet and Barthez think it is impossible to see, in the multiplicity of these phleg-

monous processes and their dissemination, even in their metastatic character, anything less then a general cause such as numerous French writers speak of as a purulent diathesis. Bidder observed suppurating joints five times in young children, suffering from variola, and in each there was coincident formation of abscesses. Bourcy rejects the theories of metastasis, and believes in a variolous intoxication as the determining cause.

Trousseau mentioned years ago that in cases of small-pox, joint inflammations apparently very easily took on a purulent character, and was of opinion that this peculiar disposition to suppuration was the result of a specific action. He distinguished between multiple joint inflammations of this character and true metastatic pyæmia, which latter begins usually on the 9th to the 14th day and at a time when the skin is beset with pustules. True pyæmia according to Curschmann (Ziemssen's *Hand-book*) appears to be a very rare complication. Two very instructive cases of purulent arthritis following small-pox were reported respectively by Guersant in 1834 and Thomas in 1835. The former case was that of a lad of sixteen, who having just recovered from pneumonia, was seized with small-pox. One joint after another was involved, and a severe conjunctivitis was added to his other troubles. Rigors set in with extreme emaciation and diarrhœa. He died four weeks after, and upon dissection pus was found in most of the affected joints as well as in the tendon sheaths. The second case was that of a young man, æt. 21, who on the 28th day of an attack of dysentery developed variola. He also died with multiple pyarthroses, and pus was found in numerous joints. The cases reported by Bidder appeared mostly as periarticular rather than intra-articular collections of pus, and partook somewhat of the character of suppurative epiphysitis. He is rather of the view that the deeper lesion in such cases is a result of extension from the overlying skin, inasmuch as the joints whose cavities are nearest the surface are mostly affected. The occurrence of acute abscesses in the bones has also been noted, especially by H. Fischer. When we consider the mass of pustules which cases of this character present, we have reason to wonder that suppuration in deeper tissues is not the rule rather than the

exception. Guttman found pyogenic staphylococci in the contents of the variolous pustules and vesicles as well. Garré succeeded in cultivating streptococci from the juices of various organs, from which it appears that pyogenic microbes are carried in the blood to all parts of the body, and we are compelled to fall back on the view that, as a rule, the tissues even when poisoned with this disease do not furnish favorable soil for their development.

Neve, speaking of the confluent variety of small-pox, says that the formation of boils and abscesses is common, and that it is not strange that, in a suppurative disease like variola, symptoms of a pyæmic nature should occur. Inasmuch as we do not yet know the specific germ of small-pox, we are unable to state whether it possesses pyogenic properties, or whether the pustules which characterize the disease are the result of mixed infection or not. Presuming that the latter is in many instances the case, it is easy to see how the poison may be absorbed by the lymphatics, and passed on to the small veins, from which it may be scattered far and wide; and undoubtedly many of the abscesses met with in this disease, as well as the cases of necrosis, may be explained as metastatic phenomena. Of thirty-six cases of bone and joint disease commented on by Neve, four were cases of alveolar necrosis, twenty-six suffered from joint disease, and in twelve one or more epiphyses were affected. The upper extremity was the more commonly involved, which he explains by the fact that most of these patients were children, and that little children use their arms more than they do their legs.

The occurrence of orchitis has been noticed in various febrile affections. Velpeau and Berand have described a form developed during small-pox, and Trousseau speaks of it at some length.

Cerebro-Spinal Meningitis.

It seems to be fairly well established now that this disease, certainly its epidemic form, is of microbic origin, and this being the case we need not be surprised to find evidences of secondary infection, providing only that patients live long enough to develop them. As a rule, however, death occurs

with such rapidity that time for secondary symptoms is scarcely offered. Nevertheless, the studies of such authors as Grisolle, Laveran and others show that we do have at least articular complications, and that from the fifth to the eleventh day, if life persist so long, acute arthritis may occur, often with suppuration. The larger joints are those commonly attacked, including probably those of the vertebral column. In this fluid according to Cornil and Babes, bacteria are always found.

Infectious Pseudo-Rheumatism.

This forms a chapter in the monograph of Lapersonne, who describes under this term certain cases of usually multiple synovitis or arthritis whose prime cause it is impossible to discover. They come on sometimes as the result of fatigue following trifling injury or burn, sometimes after a sore throat, even mild, and sometimes without any appreciable cause. They are preceded or accompanied by constitutional symptoms, which are sometimes mild like nausea and malaise, and sometimes violent like delirium, severe headache, etc. Locally these cases present two forms, the pyretic and the apyretic. Under this term he includes quite a number of fatal cases in which, upon autopsy, were found all the ordinary anatomical manifestations of an infectious disease. He insists upon their separation from typhoid fever, from ulcerative endocarditis, and above all from acute articular rheumatism.

Infectious Endocarditis.

Only within thirty years has the individuality of this disease been recognized. In the interval since Rokitanksy and Virchow dispersed all doubt as to the existence of acute ulcerations of the endocardium, numerous researches have been made, and the names of Pelvet, of Klebs and Weigert, of Prudden and Osler, along with a host of others, must always be prominent in the history of the subject. That the disease deserves the characterization often given to it of *malignant* is well known. It is, in fact, an infectious disease with especial localization in the heart, the

term cardiac typhus, given to it by some, being very expressive. Although so often apparently spontaneous, it is in fact usually a secondary disease; in large measure it is a secondary infection. Its parasitic nature is of course placed beyond a doubt, although we have learned that the organisms which may cause it are the common and well-known pyogenic cocci, their virulence in these cases being as intense as in cases of infectious osteo-myelitis. When we consider the peculiar location of the lesion in this disease, we shall have no difficulty in appreciating the readiness with which metastatic complications may arise; the wonder is rather that they do not always occur. The arthritic manifestations are usually of a pyæmic character, although even at the beginning, as Trousseau pointed out, there are frequently severe joint pains. Abscesses may form very rapidly, while around the joints there occurs a diffused œdema which is simply another sign of the intensity of the trouble.

The specific or infectious form of endocarditis is perhaps to be separated from a non-septic form of acute endocarditis, which is perhaps of acute rheumatic origin, in the course of which we have, however, perhaps at the same time, multiple hæmorrhages and articular effusions, which latter, according to Strümpell, are of a serous and not a purulent character.

Erythema Nodosum seu Multiforme.

By some writers this has been classed among the infectious diseases. Trousseau ranked it among the eruptive fevers. Hardy considered it a manifestation by itself, to be compared with post-scarlatinal rheumatism. Other French writers consider it as a specific disease whose external expression is the eruption. In 1886 Villemin reported to the Academy of Medicine eleven cases of so-called infectious erythema. In his fourth case he had noticed severe arthritic manifestations in a number of joints, which he considered as connected with the primary disease. The writer has had no experience with complications of this character in this somewhat rare disease. A case occurring recently in his practice, however, is worthy of mention in this connection. A middle aged man of rather

free habits, was operated on for numerous and deep strictures of small caliber. The first week after the operation passed without especial incident. With the beginning of the second there appeared the multiform manifestations of this condition, which seemed to be exaggerated by each of two successive soundings with a large sized steel sound. Finally the eruption took on a nodose character in severe form and gave rise to some apprehension for a few days. There were no joint complications in this case, and the erythema itself must be considered as secondary to the surgical intervention. I find that dermatologists speak of the occasional supervention of this disease after surgical operation or irritation. Nevertheless, if it be in any sense a specific disease, one can see how from an infected and unhealthy urethra, abundant opportunity for the entrance of the germs is offered.

TUBERCULOSIS.

So much has appeared of late on the matter of tuberculosis in its surgical and pathological relations, that the space assigned to it in these lectures will intentionally be made small as compared to its importance. To only two or three phases of the subject shall I invite your attention. I desire to make it clear, however, that tubercular mixed infection may be of two kinds: First a condition in which we have a secondary pyogenic infection of a primary tuberculous focus, and, second, a tuberculous infection of a previously healthy area, or of a wound whether healing kindly or suppurating. I do not know that anywhere proper and distinctive attention has been called to these two manifestations. Instances of each of them must be extremely common, and I need but to illustrate them to you to be sufficiently explicit.

Let us take first a primary tubercular infection in the lungs. Lung texture previously normal has become infected, and in consequence is studded with few or many miliary tubercles which later coalesce and form what we call a tubercular nodule. Certain physical signs indicate this state of affairs. A little later we have a secondary infection of this nodule by pyogenic and saprophytic organisms, the result of their action

being the formation of an abscess or as we say a lung cavity. This abscess may be miliary in size, or may produce a cavity as large as a hen's egg. This occurs in the lungs; its counterpart may be met with in any of the viscera or in the glandular system.

Take now a more distinctively surgical view of the same character of lesion. From some cause which it is not necessary here to discuss, the cancellous tissue in the neighborhood of an epiphysis becomes infected, miliary tubercles form, and there results that peculiar proliferation of tissue which the Germans call fungoid, and which we may speak of as infectious granuloma. As this increases in amount it erodes away other tissues and so advances in other directions, now perforating a joint, now boring through the periosteum and soft parts to appear at the surface by a livid purple area, after which complete perforation of the skin may follow; or tunneling beneath strong fasciæ, extending always in amount, and causing irritative hyperplasia in its vicinity, whose combined external manifestations are constituted by more or less swelling. It is frequently possible to find or to cut into such tissue at a time when it shall present nothing more than is described above. Up to this point we have a primary tuberculous lesion, but the clinical or pathological picture is liable to change at any time, and in addition to the above we then have all the added signs and symptoms of rapid or slow suppuration; all of which means a secondary infection by pyogenic or putrefactive organisms, while in the pus which may be later evacuated from such a focus tubercular bacilli may or may not be found, this depending in large measure on whether the collection be recent or old. These are illustrations of the first form of tubercular mixed infection.

Illustrations of the second are, perhaps, a little less familiar to those not engaged in surgical practice. Let me adduce a few illustrations.

A child originally healthy suffers from scarlatina. As a consequence of this he has purulent otitis with destruction of the membrana tympani, and exposure of the cavity of the middle ear to the outer world. The case goes on for an indefinite time as one of this character, when, later, tubercular infection

takes place, in consequence of which we have specific caries of the bone with perhaps tubercular meningitis and death. In this case we might legitimately speak of the tubercular feature as constituting a tertiary infection.

Again, it is well known that dental caries is due to the specific action of several forms of micro-organisms, whose biology and properties have been illustrated by Prof. W. D. Miller. A tooth, which has been more or less destroyed by such agencies, permits a secondary tubercular infection to take place, more probably around it than through it, in consequence of which we have the well-known enlargement, always tubercular, of the cervical or sub-maxilary lymph nodes, in whose case again a tertiary infection occurs, this third time with pyogenic organisms, and now we have an abscess in the neck.

Again, a patient suffering from secondary or tertiary syphilis develops specific ulcerations in the nose or mouth. It is very possible for him to suffer from tubercular infections of these lesions before they heal, in such a fashion that he may recover from the syphilitic while being still contaminated by a tubercular lesion. In some such way as this undoubtedly many cases of combined syphilis and tuberculosis do occur.

Once more, let me quote a recent case of my own as serving as an excellent example: A strong and perfectly healthy man of excellent antecedents sustained a railroad injury of such a character that I was compelled to make a resection of the elbow, and the laceration of tissues was such that it was impossible to so perform it as to get recovery without necessity for granulation and consequent discharge of puruloid material. Necessity compelled the placing of this man in a small ward where were several other patients who were suffering from tuberculosis. This wound made rapid and favorable progress for some three weeks, when suddenly its aspect changed, its granulations became œdematous and it took on every aspect of a tuberculous ulcer. I deliberately watched it for a little while, and then made a second operation which comprised a scraping out of all infected tissue and the restitution of the parts to an aseptic condition. He was then sent out of the hospital and made rapid and complete recovery. Examina-

tion of the suspicious tissue removed showed tubercular bacilli present.

Another case, is that of a perfectly healthy young lady, who suffered from anchylosis of one elbow due to severe inflammation some years previously. Her physical condition and constitutional appearance left nothing to be desired in this direction. I resected her elbow, and the wound completely healed with a very little suppuration, to subsequently re-open at two points and display every local evidence of tubercular disease. In her case I cannot trace the source of the infection; in the previous case I can.

But why repeat, in what must be wearisome detail, examples of what everyone sees daily, though he may not attach sufficient importance to, or see the facts in their complete illumination. For my own part this topic of mixed and secondary infections consecutive to tuberculosis is perhaps the most important touched upon in this list because, largely, it is the most common. When I look over my own case books I find that from 20% to 25% of my cases concern this protean malady in its surgical relations. And others, like König, for instance, report that nearly 35% of their clinic cases are of the same nature. Do not such figures give it an overwhelming importance? And nevertheless are not the few instances which I have adduced as illustrative as a larger number?

Inasmuch then as I aim in these lectures only to be suggestive and illustrative, realizing that the time at hand permits nothing more, I must pass on; stopping only to remind you that the bones and joints are so freely spoken of during these remarks for the double reason that they afford as good examples of such lesions as any parts, and because they so especially interest the surgeons.

GLANDERS.

Clinical experience, especially that of veterinary surgeons, leaves no doubt as to the articular or secondary complications of this disease, whose contagious character has been recognized since the beginning of this century. Since the contagious nature of the disease was proved a few writers have in-

sisted, and with reason, upon the occurrence of articular complications, and Bonnet in his treatise has given a characteristic example. Elliotson has noted the presence of pus within the knee, and several times the knee, hip, shoulder and elbow have been found involved. Suppurative tendo-synovitis has also been met with, especially underneath infected skin. These complications are more common after acute glanders than after the other forms. A genuine polyarthritis much like that of acute rheumatism, not going on to suppuration, has also been observed. These are all secondary infections, save possibly the last named.

Anthrax.

If we are to accept without question the opinion of Davaine and Pasteur, articular manifestations do occur in the course of this essentially infectious disease, although they are certainly rare; but we fail to find report of a single case where this is established without a doubt. A case quite suggestive, however, is reported by Chassaignac in his treatise on suppuration. It concerns the case of a young man, æt. 34, previously well, who contracted malignant pustule from the carcass of a sheep. Multiple pustules appeared upon the forearm and hand, and for their relief repeated cauterizations with the actual cautery were practiced. A little later swelling and elastic tension were observed upon the lateral aspect of the trunk, and there were fever, general malaise and peculiar pains about the joints, which latter swelled and acted as if affected with acute rheumatism. The patient made a slow recovery without secondary suppurations. Bollinger also has described certain cases of about the same character, from which it seems to me that the occurrence of mixed, if not secondary, infection is possible in these cases, although very rare.

Syphilis.

Syphilis stands in a somewhat peculiar position in this list of diseases since its manifestations which concern us here are usually connected with that form of neoplasm which is prac-

tically an infectious granuloma. Of course, the syphilitic patient by virtue of whatever cachexia he may manifest is the more liable to suppuration on slight provocation than the healthy individual. Furthermore, by virtue of the many ulcerated lesions which these patients present, the path for secondary and pyogenic infection is widely opened. Of course, too, we are yet ignorant of the infectious agent in this disease. So far as we now know, however, there is no clinical fact leading us to believe that this agent, whatever it may be, can ever be pyogenic when uncontaminated. In this respect it appears to differ from the tubercle bacillus, since abscess formation and breaking down are common in syphilitic and tubercular gummata alike, and there is every reason to think that the former are invariably, and the latter, at least most commonly, the result of mixed infection with pyogenic or perhaps saprophytic organisms.

As far as the joints are concerned it is not often, at least, that we have a true syphilitic arthritis, and a suppurating joint in an active case of syphilis must probably always be due to mixed infection. A hundred years ago John Hunter declared that he had never seen constitutional syphilis attack the articulations, and this was at a time when venereal diseases were sadly confounded.

On the other hand, in 1853 Richet claimed that syphilis alone could provoke synovitis and articular ostitis in subjects who presented no sign of scrofula. Still later Chomel spoke of hydrarthosis and hyperostosis of joint-ends as exceedingly rare manifestations of syphilis; but the infectious arthritides of syphilis were well treated of by Lancereau, after him by Fournier; and still later by Schüller, Volkmann, Mracek and others. But the non-suppurating lesions of late syphilis have no interest for us here, and we must close this short reference to the subject with the repetition of the statement that suppuration in these cases whether occurring in the brain, in the liver, in the epididymis or in joint cavities, is always the result of a mixed or secondary infection.

GONORRHŒA.

This disease belongs among those infectious processes which often give rise to joint inflammation as well as disturbance in the bones. Its most common arthritic complication is, perhaps, the most frequent sequel of any that have been noted among the infectious diseases. In time past the French authors have made a very determined effort to group this disease among those of constitutional character. How earnestly they have worked in this direction may be seen in the writings of a large number; for instance, Pidoux has endeavered to show that gonorrhœa is a constitutional disease because of the pallor and facial expression, the rapid emaciation, the discoloration of the skin, occasionally noted, and other such insignificant features.

That there is in these cases a disturbance of the general system, or a sympathetic affection of functions, may be easily granted; but the endeavor to show the disease is *per se* of other than local character finds now-a days very few if any sympathizers. Its last claim to this regard has been taken away from it by Neisser's discovery of a specific micro-organism which is capable of attacking only a very few mucous membranes. That arthritis is by no means the only surgical sequel is shown by the occurrence of such remote and inexplicable disturbances as iritis, which may occur without a secondary affection of the conjunctiva, while a form of conjunctivitis is known which does not partake of the purulent character. According to statistics presented by Nolen, 116 cases of gonorrhœal arthritis were accompanied by a conjunctivitis of the lids and bulb, or serous iritis, or by both. That some constitutions are much more easily affected than others is as true of this disease as of every other infection, but we are by no means prepared to accept that which the French have spoken of as the blennorrhagic diathesis.

The relations between blenorrhœa and gout or rheumatism were perhaps first alluded to about a century ago by Swediaur and Hunter, or even before them by Baglivi. The school of the Midi, the works of Ricord, of Cullerier and even of Velpeau, put the question upon a scientific basis, while the articles of Grisole, Ravel, and especially the chapter which Bonnet devoted to it in his work on the Joints, gave the topic an indentity of its own which has still later assumed yet greater proportions.

Literature concerning the gonorrhœal joint complications is most extensive, and the conflict of opinion concerning their character has been at times almost fierce. Nolen, for instance, studying the cases above referred to, 116 in number, takes the ground that there is no reason why this affection should be separated from polyarticular rheumatism, and there being no reason why a rheumatic individual may not suffer from the local disease, one may appreciate how up to a certain point it is possible to have something that might be termed gonorrhœal rheumatism; but that the disease usually alluded to under this name has something in it essentially different from rheumatism pure and simple, is definitely proven by such a discovery as perhaps Petrone was the first to make, viz: of Neisser's gonococcus in the joint fluids from such a case. The arthritic complications of gonorrhœa, as of most of the infectious diseases, comprise a trifling serous effusion, a catarrhal form and a genuine purulent form. In Nolen's cases he found arthralgia seven times, hydrarthrosis twelve times, serous synovitis sixty-four times, a purulent condition twice and arthritis deformans six times. These joint complications occur usually in younger patients, æt. from 20 to 30, and almost always in men. Only urethral or vaginal discharges lead to the complication, balanitis and posthitis never. Some authorities take the ground that arthritis never occurs in men unless the membranous portion has been involved; also, and I think with reason, that only the truly specific forms of blenorrhœa are likely to be followed by these results. One peculiarity seems to separate these troubles from the essentially rheumatic, and that is their great tendency to recurrence. Volkmann saw one individual who had joint complications after each one of seven local attacks. Frerichs even goes so far as to say that this commonly harmless disease may lead to death, but death as it were of a suicidal character. Joint symptoms set in most commonly during the second week, although sometimes not until all local symptoms have disappeared. The true arthralgias are often complicated with equally painful myalgias and ostealgias. The knee and the ankle are most commonly involved. Sometimes we have such a polyarthritis as to constitute a verisimilitude to a true rheumatic attack. Occasionally even the tendon

sheaths and the bursæ take part in the disturbance, and to tenderness and sensitiveness in the tendons is added a swelling of the bursæ.

More serious and lasting disturbance than a temporary arthritis is by no means unknown. Complete anchylosis is rare, but painful joints whose function is long disturbed are common. Trendelenburg had recently to resect an anchylosed elbow thus stiffened, and he mentions a case from Langenbeck's clinic in which most of the joints, even these of the vertebrae, had become anchylosed to an extraordinary extent. With mere serous effusions, although they constitute a majority of these cases, we have in this place nothing special to do, but as already seen a true catarrhal inflammation is sometimes met with. Whether here we have to do with an unusual manifestation of activity on the part of the gonococci, or whether with a mixed infection, it has been in time past difficult to state; but as remarked in Lecture III, Neisser's diplococci are not known to have by themselves any pyogenic power. This would appear to be proven by a series of observations like that of Petrone, which have been repeated by numerous others, myself included. In the clear or almost clear sero-fibrinous effusion we have found these diplococci, yet never any pus unless other organisms were present. On the contrary when pus has been found other organisms are always present, *i. e.*, staphylococci and streptococci. There is reason to think that this is the case even in the urethra, which is never; at least in individuals subject to infection, free from the common pyogenic forms. In the seropurulent forms of joint effusion, we have apparently to deal with an infected fluid quite similar to that existing in a case of sero-purulent pleuritic effusion, which is capable of absorption, at least of the fluid portion, with death of the active organisms, and without serious damage to the enclosing membrane. But we have a more distinctly purulent form than this in which one or more joints fill up with clear pus. If this form be monarticular the patient may recover with function very seriously impaired or totally lost; if polyarticular it is usually fatal, the case then being indistinguishable from one of true pyæmia. One such case I reported in some detail in the *Journal of Cutaneous and Venereal Diseases* for December, 1888,

and Nolen refers to four similar cases. Fournier reports a pyarthrosis of the elbow, which ended fatally, and Eisenmann and König each saw a case in which a purulent gonitis led to death from pyæmia. Holst treated a case in which an immense effusion in the knee joint disappeared for the most part by absorption, but brought about the pyæmic condition to which the patient succumbed eleven weeks after. Prichard incised an immense abscess on the outer side of the thigh, which was the result of a perforation of an empyema of the knee and had later to amputate the thigh. Wyschemirski also observed a polyarticular form of post-gonorrheal joint empyema which ended fatally. In the pus from one elbow Neisser's gonococci were recognized with the other cocci.

These various views have necessarily met with numerous unbelievers, many of whom have charged that the microbes of the articular fluid have about them nothing specific, and that their discovery depends in large measure upon the time at which the fluid is withdrawn for examination. As a matter of fact, however, Kammerer has found them, and Bousquet, in 1885, demonstrated in the liquid from a sterno-clavicular joint thus affected, the specific cocci of Neisser.

With reference to the occurrence of gonococci in joint fluid, the true position to-day is, as nearly as we can arrive at it, as follows:

Neisser's cocci may be found in the joint fluid in any post-gonorrhœal synovitis, though they are not necessarily always found. They are regarded by Fraenkel as the etiological agents in producing serous iritis, and if he be correct they would appear by themselves to have the property of provoking only serous or sero-fibrinous effusions. Careful bacteriological investigations of fluid taken from the joints involved in a true rheumatic inflammation fail to reveal any organism at all; but so soon as in either case we find pus, we find also the truly pyogenic organisms. Furthermore, in all cases of non-specific urethritis in which Neisser's cocci are not found, and with which they have nothing to do, we have no tendency, so far as known, to joint complications. In other words post-gonorrhœal arthritis may be due to the specific cause discovered by Neisser, though just how we do not know. Whereas whenever pus be present it is, accurately speaking, a secondary

infection. It is no more difficult to understand how the pyogenic organisms may travel from the urethra to the synovial membrane, than how the gonococcus finds its own way thither. Explanation of this fact does not seem to have as yet been furnished, and if a monarticular form of either may occur, why not a polyarticular as well? The explanation of the pyæmia arising from urethral and peri-urethral infection requires nothing more than the occurrence of a local phlebitis, septic thrombi from which can easily produce the whole disturbance. That this is not excessively rare, in one form or other, is shown by the frequency with which writers have alluded to such complications as endocarditis and pericarditis.

Participation of the osseous system in post gonorrhœal cases is much more rare, in fact only two authors have alluded to them, Petrone and Fournier. The latter has described a form which corresponds very well with the periosteal complications observed after typhoid and influenza. He speaks of extremely sensitive swellings of the periosteum which last two or three weeks, and terminate, ordinarily, by resolution, although possibly by abscess. They are met with most commonly where the bones lie subcutaneously. Aside from such abscesses as may be met with in the bones following a true pyæmic complication, I am not aware that bone abscess or acute osteomyelitis has been noted.

So far as purulent arthritis is concerned, numerous reports show the extent of the destruction which may follow. Thus Prichard was compelled to amputate a thigh, while Eisenmann lost a patient from general pyæmia after a manner quite similar to that in my own case elsewhere alluded to. Landouzy has reported the following remarkable case: A female, æt. 17, suffering from gonorrhœa, was attacked with most severe pain in the shoulder and right sterno-clavicular joint. Both joints were intensely swollen and extremely sensitive to pressure or movement, while fluctuation was well marked. A few days after her admission to the hospital there occurred a synovitis of the right peritoneal tendons within their sheaths with contracture of the foot. The joints were punctured, and the patient finally recovered, but with most marked secondary atrophy of

the muscles of the leg and those of the thorax and shoulder on that side.

This view that certain individuals produce pus with less provocation than do others was for a time made a seductive one by the talent of Lasegue. According to this view gonorrhœal rheumatism is a form of pyogenic rheumatism, and the joint lesion is an expression of an attenuated or mitigated pyæmia. This view was adopted by Guerin, and was defended by such English writers as Paget, Holmes and Barwell, and within ten years by Talamon. Another view somewhat similar was that during an attack of septic urethritis the patient suffered from a transient diathesis such as all individuals with genito-urinary diseases manifest, or a cachexia resembling that of syphilis, in the course of which not only the joints but the viscera, the whole economic system in fact, were most susceptible. It was supposed to be somewhat analogous to that which has been observed during scarlatina. This view was defended especially by Loraine.

The visceral complications of gonorrhœa are less often alluded to, but are unmistakable. Nolen found cardiac lesions in 15 out of 116 cases of gonorrhœal arthritis, and analogous effects have been reported by Peter, Fournier and by others. Leloir has reported, for instance, a case of acute pericarditis in connection with a case of gonorrhœa in a young man. The case was very severe and was accompanied with intense pain in one knee, along with which, however, there was very little swelling in the joint. Of late several French theses have appeared bearing on the subject of cardiac complications of gonorrhœa. For instance Morel has reported several cases of acute pericarditis and endocarditis accompanied by all the serious disturbances characterizing these complaints, as well as severe joint complications, and his paper is well worth careful reading. He comes to the following conclusions: First, that gonorrhœa can be complicated by inflammation of the serous membranes of the heart as well as of the joints; second, that so-called gonorrhœal rheumatism, like the common rheumatism, may affect the heart even at the outset; third, that certain septicæmic accidents may give rise to these cardiac complications; fourth, that these latter may be very rapid and

terminate fatally, although more commonly they are the causes of certain chronic lesions; fifth, that the treatment consists in first curing the gonorrhœa, and then combating by common measures the complications.

So also Marby, in a long paper on blennorhagic endocarditis has reported a number of cases, and has drawn conclusions which do not differ materially from those already alluded to. Most of his cases were observed in the service of Poucet.

Gluzinski has diligently studied the ætiology of post-gonorrhœal endocarditis and recurring pericarditis of which he has brought together thirty-one cases. He appears to see a relationship between intensity of the original gonorrhœal process, and that of the cardiac symptoms, and he lays great stress on the difficulty of deciding whether these cases are a genuine mixed infection or a truly specific one.

It would seem that these cases of complications of gonorrhœa are to be widely separated from certain disastrous surgical sequelæ of operations on the urethra made necessary by lesions of long standing. I know, for instance, of a man who had an old and somewhat deep stricture of medium calibre, upon whom a sound was passed without causing extensive pain or any alarming sign at the time, yet that night he was seized with a severe chill, and died within a week of some positively septic condition. Such cases as this, and many similar may be found in surgical literature, are undoubtedly to be explained by a minute lesion of the mucous membrane with infection of the exposed raw tissue by one or more of the forms of pathogenic and septic organisms, which abound in the urethra under such circumstances, as is well know to all who have studied it bacteriologically. To such infection succeeds septic phlebitis of the peri-urethral and peri-prostatic vessels, than which nothing can be more favorable for purposes of general infection. Such cases as these are to be studied as secondary infection after a fashion, but not after just the fashion to which I am devoting myself at present.

The Puerperal State.

Inasmuch as no essential pathological distinction can be made between the various conditions included underthe name purperal

fever, and septic complications of any ordinary wound or injury, it is impossible to make any minute distinction between the various infections which may follow this dreadful malady. Puerperal fever is essentialy either a post-puerperal septicæmia or pyæmia, and inasmuch as the septic infection in one case follows local channels, or in the other assumes the metastatic rôle when we have to deal virtually with the same lesions as those in ordinary surgical cases, and inasmuch as both streptococci and staphylococci are concerned in these cases, because they are in fact generally mixed or double infections, so the lesions display the characteristic disturbances of the well known parasitic inroads. Whether these be in the nature of phlegmasia alba dolens, an abscess during the establishment of lactation, a post-puerperal peritonitis, or the development of abscesses in various parts of the body, the active part played by these organisms is always the same and about the only perplexing problem in the matter is the reason why infection takes place slowly in some cases and rapidly in others, or why the programme is so diversified.

I remember, for instance, the case of a young primipara whom I had to see a number of times in consultation, who developed abscesses in various parts of the body, in the bones us well as about some of the joints, the neighborhood of certain epiphyses being especially frequently attacked, who nevertheless lived for several months, and finally succumbed to the exhaustion consequent upon the duration of her trouble. In the pus from one of these abscesses, I discovered both forms above alluded to, and as I think over the case now only wonder that she could have lived so long. She developed also an endocarditis of considerable severity, and this helped to terminate her life. Of course, in such a case there was no difficuly in accounting for the presence of pyogenic organisms at the time of her delivery and the primary path of infection in such cases is too well known to call for remark here. Cases so chronic as hers, however, are infrequent, and perhaps justify the prominence given to them here.

Other Genito-Urinary Lesions.

That recent gonorrhœa is by no means the only disease of the genito-urinary system by which mixed or secondary infection can be brought about will be plain upon a little furthur consideration. It is well known that abscesses in the kidneys are frequently met with which cannot be accounted for by trouble extending upward from below. While it may be hard to explain many of these cases, certainly many of them find explanation in the physiological fact that the kidneys are excretory organs, whose function is sometimes called into play for the purpose of eliminating certain pathological organisms which have gained access to the circulation. Certain other of these abscesses are due to tubercular disease in these organs, and some of these consequently are mixed while others are secondary infections.

It is also well known that normal urine when extravasated or injected is capable of resorption without provoking serious disturbance. On the other hand when overloaded with the various morbific and toxic products pertaining to many diseased conditions, it is positively toxic and if it contain, from any source, pathogenic organisms, it may, if it escape from its accustomed conduits or reservoirs, produce intense local or fatal general disturbance. Pyo-nephrosis, for instance, is by no means always a primary disturbance since it is often an evidence of secondary infection, which it may reproduce, or even cause a tertiary infection. Moreover, the results of abnormal escape of unhealthy urine, as from a ruptured bladder or urethra, are not only well known but must be regarded in the light of secondary or mixed infections. That the tissues badly bear the brunt of such infection is largely due to the intensity or virulence of the local infection. When time offers abscesses will often be met with in the joints or elsewhere about the body.

INDEX OF SURGICAL PROGRESS.

GENITO-URINARY ORGANS.

I. **The Influence of Cystoscopy upon the Diagnosis and Treatment of Urinary Diseases.** By E. HURRY FENWICK, F.R C.S. (London). The author reports conclusions based upon the systematic cystoscopic examination of large numbers of healthy bladders, of 100 patients suffering from profuse hæmaturia; of 30 cases of tuberculous or scrofulous ulceration of the bladder; of 32 cases of vesical tumor, besides many other cases of obscure reno-vesical diseases, such as pyelitic inflammations, encysted calculi, sacculated bladders, pseudo-prostatic obstructions, etc. These examinations were in some patients controlled by digital exploration or operation, and in 7 instances (in the section of vesical carcinoma) by post-mortem investigation.

Before any conclusions were submitted for criticism it was considered essential to bring forward evidence that accuracy in diagnosis, and often also in the prognosis of obscure bladder disease, could be obtained by means of the cystoscope in an early stage of the disorder. To this end all the necropsies which had been secured in the series were cited, and the specimens demonstrated. The specimens belonged to the section of vesical cancer, and each was accompanied by the diagnosis and prognosis which had been made cystoscopically, and which had been written or printed months before the demise of the patient. These few post-mortem criticisms of cystoscopic diagnoses and prognoses proved that electric cystoscopy was an accurate and important factor in the scientific treatment of obscure bladder disease.

Some of the conclusions were as follows:

Surgical Renal Disease.—The dangers of performing nephrectomy without investigation of the presence of and working capacity of the

companion gland are recognized, but the difficulties of obtaining any correct estimate of the renal power which will remain after ablation of the diseased organ are avowedly great. Cystoscopy of the urethral orifices removes much of the difficulty. The efflux establishes at once the presence of a working kidney. The sluggishness or rapidity with which the jets succeed each other marks the absence or presence of irritation in the pelvis, a slow or active secretion. The color of the jet, whether it be clear, muddy, or bloody, testifies to the normal or abnormal condition of the secretion. The urethral orifice, moreover, becomes implicated by descending changes from the pelvis of the kidney. The shape and appearance, therefore, of its orifice are not infrequently an index to the change in the corresponding pelvis and ureter. More especially is this the case in scrofulosis. As yet the catheterism of the male ureter under electric light is too difficult to be practical.

Bladder Conformation.—A natural ledge formed by the interureteral bar—the base line of the trigone—is often strikingly developed even in healthy bladders. The weakest part of the bladder is apparently immediately behind this line, for in those who have had to overcome even a slight obstruction in urination there is more or less of a gutter-shaped depression of the entire wall apparent in this position. Behind this ledge and in this gutter may be seen the smaller stones. Fasciculation and dimpling are not uncommon in healthy bladders. Figure-of-8 shaped or cottage-loaf shaped bladders are rare, but are sometimes met with: these brace the stone on to the pubes.

Calculi.—Stones in the bladder may be sometimes missed on sounding from a variety of causes which are demonstrable by the cystoscope. A small stone can be completely or partially engulfed by the approximated swollen folds of chronically inflamed mucous membrane. These folds can be seen in bladders which contain at the time of examination 4 ounces; when the bladder is distended to 8 ounces or 10 ounces the stones drop on to the base. Medium sized stones (1 to 2 drachms in weight) are often lodged behind the interureteral bar, and may be seen partially sunk in heaped up swollen mucous membrane. Some stones are seen completely covered with flocculent mucus or with blood clot. All such may be overlooked in sounding on account

of the circum- or superjacent soft material. Stones in pouches (sacculated stones) are rare. They are missed for three reasons: (1) the orifice of the sac is narrowed in incomplete distension; (2) superadded to this the orifice is further narrowed because the mucous membrane lining the mouth is often greatly swollen and gelatinous with inflammation. These sacs are usually near the ureteral orifices. It is therefore recommended that bladders be well distended, after the chronic swelling has been reduced, before being sounded.

Ulceration.—It is perhaps hardly realized by the profession that a very large proportion of cases of obscure pains in the perineum and penis, accompanied by hæmaturia, are ulcerations of the posterior wall of the bladder. Such ulceration may last for years without extending Not infrequently they are covered with lime phosphate. It is more than probable these were the cases encountered by Sir Henry Thompson, and reported by him as "digital exploration. Nothing found except a scale of phosphatic matter adherent to the bladder." Such cases are greatly benefitted by lactic acid injections, 1% to 4%, given daily, or by scraping. It might be supposed that pellucid urine would exclude the presence of ulcerations of the bladder. This is not always so. The author has seen deep ulcers with perfectly clear urine. There is a near connection between these ulcerations and tuberculosis. Such ulcerations are easier seen than felt.

Tuberculosis—The straining, frequency, and pain observed in tubercular renal affections are not always due, as is taught, to reflex conditions. In many cases such symptoms are explained by great swelling of the mucous membrane around the orifice of the bladder impeding the outflow of the urine. This may be caused by the direct irritation of the urine or by the implication of the subjacent prostate. The bladder appears to be most often the origin of urinary tuberculosis.

Tumors.— Carcinomata are the most common. Villous papillomata are rarer. Pedunculation is not a criterion of the nature of the tumor. Although only 3% of museum carcinomata are pedicled, yet in the early stages of the softer forms of bladder cancerous tumors, pedunculations, or subsessility is not uncommon. It is, perhaps, relatively

commoner in female bladders. This being so, the earlier the examination and operation are undertaken the greater the chance of the successful removal of pedicled carcinomata. Very many carcinomata have shreddy necrotic surfaces, which may be mistaken for villous growths. The onset symptom is, in a large majority of cases, a hæmaturia. This has no relation to benignancy or malignancy as is taught, but depends upon the delicate texture of the growth. The appearance of the blood does not mark the birth of a growth, but is due to some traumatism of a pre-existing tumor or some degenerative surface change.

The frequency of micturition and pain in vesical neoplasms depends usually, in the earlier stages, on part of the growth floating into the urethral orifice and plugging the outlet; thus atony and residual urine are not uncommon in all forms of vesical growth. The oscillations in the severity of the symptoms of a patient suffering from vesical growth are due (as in ulceration and stone) to transient flushes of localized cystitis.

A prognosis depends mainly upon the amount of implication of the wall of the bladder, also upon the position of the primary growth, whether it be on the posterior wall or near one of the three orifices of the bladder. In the latter positions the disease kills quickly; those situated on the posterior wall take about two years for completion. The most common situation for primary growths is in the neighborhood of the urethral orifices. Much needless operative interference can be prevented by the cystoscopy of bladder tumors, and the best method for attacking the growth (the choice of the suprapubic or perineal routes) is settled by such an examination.—*British Medical Journal*, October 18, 1890.

II. On a Case of Nephrolithotomy (Following Nephrectomy) for Total Suppression of Urine Lasting Five Days; Complete Recovery and Good Health Five Years after the Operation. By R. CLEMENT LUCAS, F.R.C.S. (London). This case was mentioned by the editors of the medical journals at the date of the operation, in 1885, as a case of exceptional interest, but the de-

tails of the case have never been before published, nor has the patient, or the kidney, or the stone which caused suppression, ever been exhibited before. The author had delayed publishing it because those to whom he mentioned it, whilst applauding the attempt to save a life on the extreme verge of dissolution, threw the coldest doubt upon the patient's future, maintaining that even if she recovered from the immediate effects her life must be a short and painful one; that the one remaining kidney, having been opened and drained, would rapidly degenerate, or another stone would quickly form and bring about a final catastrophe. After the lapse of five years the author thought he might be acquitted of any attempt to claim an incomplete success. The patient is still living and enjoying the best of health, and a freedom from pain discomfort, and hæmaturia, which, for seventeen years before her right kidney was removed, were almost constantly present. The operation for total suppression of urine was one that the author had long considered justifiable, and he had on more than one occasion previously publicly advocated its performance.

The patient had been under the care of Mr. F. D. Atkins, of Sutton, Surry, to whom much credit is due, both for the original diagnosis and for the promptitude with which he acted when total suppression occurred.

F. F—, æt. 37, was first admitted into Guy's Hospital on June 22, 1885. There was a strong family history of consumption. For seventeen years she had suffered from hæmaturia at intervals, and for nine or ten years this had been accompanied with pain on the right side of the abdomen, and for seven years a tumor diagnosed as a floating kidney had been felt on this side. On July 14 the right kidney was removed by lumbar incision. It was a mere shell containing masses of stone, and weighing 21 ounces. The wound healed completely, and she left the hospital convalescent on August 10, just within a month of the operation. All went well for three months. She had returned to her household duties, was free from pain and hæmaturia, and much satisfied with the result of the operation.

On Sunday morning, October 24, 1885, she was suddenly seized, between 7 and 8 o'clock, with most violent and agonizing pain in her

back and left loin. The pain passed through the loin to the front of the abdomen and groin. About 8 o'clock she passed a little urine, but from that time all secretion stopped. Vomiting commenced about half-past eight on the same morning, and was continued at intervals and whenever anything was taken. Mr. Atkins was called to see her, and found the bladder empty. Vomiting and anuria continued throughout Sunday, Monday and Tuesday.

On Tuesday Mr. Lucas met Mr. Atkins in consultation, and advised operation.

The symptoms continued without cessation on Wednesday, when she was brought to London, but Mr. Lucas's medical colleagues still advised him to postpone operation till a further trial had been given to diuretics, and in deference to their opinion he waited another day. On the afternoon of Thursday, the fifth day of anuria, the patient became drowsy and weaker, so that it was difficult to rouse her to obtain answers to questions. Her pulse was weak, her temperature 99°, and she had become less sensitive to pain and indifferent to what was passing around. Ether was given, and Mr. Lucas cut down on her remaining kidney and discovered a conical stone acting as a ball-valve to the top of the ureter. The stone was rather more than three-quarters of an inch in length, and from three-eighths to five-eighths in diameter. Urine began to drop away out of the wound as soon as the pelvis of the kidney was opened, but the pelvis was not found much dilated.

The patient recovered well from the anæsthetic, and was sick once only after the operation. For twelve days all urine was passed by the wound in the loin. Then an ounce and a half was passed with great pain from the bladder, and the quantity gradually increased.

After the nineteenth day all the urine was passed naturally. The wound ran an aseptic course, and the patient's temperature scarcely rose above normal. Healing was complete ten weeks after the operation. During the last five years she has been employed in household duties, and has enjoyed good health.

The patient was exhibited, together with her right kidney, which was excised, and the stone removed from the left kidney for total suppres-

sion of urine.—*Proceedings of the Royal Med. and Chirg. Society, 1890. Author's Abstract.*

III. Double Nephrolithotomy for Renal Calculi Complicated by Pyo-Nephrosis. By MR. TURNER (London). A woman presented two large renal swellings, anuria, vomiting and great prostration, and a well marked history of renal calculus. He first cut into the right kidney from which he removed a mass of calculi with malodorous pus, weighing an ounce; the other side presented the same condition. The patient recovered very well from the immediate effects of the operation, but died thirteen days later from asthenia. The author believed this to be the only case on record of double nephrolithotomy at one sitting.

In the post-mortem records of St. George's Hospital for 21 years past he found 43 cases of renal calculus, in 19 of which multiple stones were present. In but 9 cases were both sides affected, two of which had been subjected to operation for calculous suppression of urine. Of the one-sided cases the stone was on the right side in 17, and on the left in 15. Pyonephrosis was present in 12 cases. The ureter was completely blocked in 9 cases, in 8 of which the obstruction was at the renal end. The stone was 5 inches long in one case. In the one-sided cases, the unaffected kidney was free from degenerative action in but 8 instances.—*London Lancet*, Jan. 17, 1891.

IV. Nephrolithotomy on Both Kidneys with an Interval of Two Years with Death Due to Hæmorrhage From the Renal Wound. By R. J. GODLEE, F.R.C.S. (London). A man, æt. 37, two years after the development of renal symptoms, was subjected to nephrolithotomy for calculus and pyelitis of the left kidney, mischief being also suspected in the right. A large quantity of uric acid and phosphatic stone was removed, and the patient made a rapid recovery, but the closure of the wound was not permanent, and after several febrile attacks, it was found best for the patient to wear a plug permanently in the fistula to prevent periodical accumulations of pus and urine in the kidney. At one time, the ureter was completely blocked and an operation was undertaken to remove a stone which

was supposed to be obstructing it; none was found, but the ureter became again patent after the operation, and the state of the kidney very much improved. The symptoms pointing very strongly to calculus in the other kidney, it was exposed a year later, and large masses of uric acid stone removed. No bleeding followed the first incision into the kidney, but the laceration caused by extracting the calculi produced very free venous hæmorrhage, which was readily controlled by pressure. At the completion of the operation there was little or no bleeding, but it was thought safer to plug the kidney; the patient remained in fair condition for an hour and a half, and then suddenly died as the result of fresh hæmorrhage from the kidney.

Mr. Mayo Robson (Leeds) had performed nephrolithotomy in a case where a small incision into the renal substance was followed by violent hæmorrhage, which he was unable to restrain by ordinary means, and he was finally compelled to excise the entire kidney in order to save the patient's life; the source of the hæmorrhage was a wound of an abnormal vein in the capsule. In another case where violent hæmorrhage had followed nephrolithotomy, the bleeding appeared to cease, but it became necessary to excise the kidney, but with a fatal result.

Mr. Arbuthnot Lane (London), in a case of severe hæmorrhage, had been able to control the bleeding by sutures passed through the kidney substance.—*London Lancet*, Jan. 17, 1891.

V. Nephrolithotomy. By E. Gifford Nash (Plymouth). The following four cases were subjected to operation at the South Down and East Cornwall Hospital, the first by Mr. Swain and the last three by Mr. Whipple.

1. A man, æt. 24, presented a history of an attack of pain in the left loin three years previously, radiating into the groin and lower abdomen and causing nausea; these pains, recurring about once a week, have been at times followed by hæmaturia and have been aggravated by jolting movements. Deep pressure in the left loin revealed tenderness but no renal enlargement, while urinary examination showed a trace of albumen, a few blood discs and no crystals. An incision 3 inches long between the last rib and the crest of the left ilium, discov-

ered the kidney high up, in which was found a small oxalate of lime calculus, about the size of a pea; this was fixed between the fingers and extracted through an incision in the renal cortex. Free hæmorrhage occurred from the incision, controlled at first by tamponing and later by iced boracic lotion. A drainage-tube was inserted, and a wood-wool dressing applied. The patient passed on to recovery in about two months.

2. A man, æt. 45, during the preceding 20 years, had suffered at intervals of two or three weeks from paroxysms of pain in the right loin, extending also to the groin and testicle of the same side. Five years from the first attack, and until about a year ago, he began to pass gravel at intervals. Five weeks ago, the symptoms all began to increase to an intolerable degree. The abdominal walls were thick and owing to their adiposity, the kidney could not be mapped out. The urine contains albumen, a few blood and more pus cells, oxalate of lime crystals and a few granular casts. The right ileo-costal space was incised parallel to and about an inch and a half below the last rib. Manipulation of the kidney was negative, but punctured with a hare-lip pin located a stone at once. Incision of the cortical tissue made it possible to turn out with a lithotomy scoop and the finger a feathered oval oxalate of lime stone, weighing 275 grains. Free hæmorrhage was controlled by sponge tampons, which were removed on the following day, and drainage and dressings applied, the patient making an excellent recovery, and being discharged on the eighty eighth day.

3. A man, æt. 32, had received a spear wound in the right loin five years previously and had afterward been treated for an abscess at that point. Pain still continued in this region, being of a throbbing character, and not radiating to the testicle. The urine was slightly acid and contained pus cells and oxalate of lime crystals. After admission to hospital his temperature maintained a constant elevation. Through an incision parallel to the right last rib, the kidney was exposed and opened, discovering pus and several calculous masses, the total weight of which was 124 grains. The patient did not rally well and complained of urinary retention which catheterization failed to relieve on account of a urethral stricture. Death occurred the same evening,

and the autopsy showed the existence of a large perinephric abscess about the right kidney and extending to the liver, about half of the right and a third of the left lobe of which had been destroyed by it.

4. A woman, æt 36, had, during the two previous years, suffered from periodic attacks of lumbar pain, radiating at times toward the groin, which had latterly become constant. She had had several attacks of renal colic, accompanied by vomiting, but had noticed nothing like gravel. Micturition had been painful; the urine was acid and contained a little albumen, and excess of phosphates, pus and blood cells and oxalate of lime crystals. Exploration showing that there was nothing in the bladder, the right kidney was exposed by an incision parallel to the last rib and punctured with a hair lip pin in four places without perceiving a stone; but exploration of the pelvis with a finger through an incision in the cortex revealed a small oxalate of lime calculus, weighing 29 grains, which was readily removed. Air having been heard entering through the wound, the pleura was thought to have been perforated. The patient made an excellent recovery under a dressing of boracic lint and wood wool in about six weeks.—*London Lancet*, Dec 13 and 20, 1890.

VI. The Importance of the Post-Prostatic or Trigonal Pouch in the Surgery of Vesical Calculus. By G. BUCKSTON BROWNE (London). Errors in sounding for stone, remarks the author, have perhaps attracted more attention than mistakes in the diagnosis of any other surgical malady, and the best way of removing a stone from the bladder is even still a frequent matter for argument and difference of opinion. The chief cause of this uncertainty is the fact that the bladder is not always a simple sac, but sometimes has pouches, pockets or sacculi opening out of its general cavity, in which stones may lie and escape the diagnostician's sound, or the lithotrite, tube or forceps of the operator. All this is simple enough, and known to every surgeon, but the fact that vesical sacculi are of very different kinds is not universally known or appreciated, and great error is caused by speaking loosely of pouched or sacculated bladders, as if all the pouches of a bladder were alike. Bladder pouches may be divided into three varieties.

a. The well recognized sacculus, which may be called the ordinary sacculus, consisting of a protrusion of mucous membrane between the muscular fibres of the bladder; they are found in the upper part, at the sides and in the floor of the bladder, and where it is covered with peritoneum, they are covered by the same membrane.

b. The post-trigonal pouch, a pouch often formed behind the trigone; *i. e.*, behind a line drawn between the the vesical orifices of the ureters, is a part of the general cavity of the bladder, but is sometimes deep enough to make difficult the discovery of a stone lying within.

c. A post-prostatic or trigonal pouch, which has hitherto received little notice, although it is the chief cause of error in searching for stone and of imperfection in its removal, whether by the lithotrite or the knife. It is often of extraordinary depth. If it be considered with the patient recumbent, it may be said to consist of the trigone of the bladder, pushed down between the enlarged and projecting prostate in front and a thickened and firm inter ureteral ridge behind. Where there is much intra-vesical prostatic projection, the pouch may literally be roofed over by this prostatic outgrowth. Calculi here cause much pain, since the trigone has a larger nerve supply than any other part of the bladder. Lying in front of and below the orifice of the ureters, the pouch is a perfectly contrived trap for catching and retaining renal calculi upon their entrance into the bladder, and a most favorable site for their growth.

Seven cases were reported in great detail in which these pouches prevented a cure by lithotrity, or where they so concealed stones as to prevent their discovery when sounding in the usual way. The conclusions to be drawn from their consideration are:

1. To insist, in all doubtful cases of vesical suffering, where the prostate is enlarged, upon careful search behind that organ. In sounding in such cases, it is not enough merely to reverse the beak of the sound, but thorough examination must be made with the reversed beak for the slit-like opening between the intra vesical prostatic growth and the intra-ureteral ridge, which may be the sole means of access to a larger post-prostatic pouch, where such a pouch exists. For this

investigation a broad, flat bladed lithotrite, designed by the author, will be found useful. The broad flat beak is easily reversed when in the bladder, and it slips with greater facility than the beak of an ordinary round-ended sound under the projecting lobe of the prostate, allowing the space under it to be as fully explored as possible by any instrument introduced by the natural passages. Help may sometimes be afforded in this exploration by inserting a rectal bag into the bowel before sounding, or by an assistant making upward pressure with his finger in the rectum. The endoscope, as in too many of the really obscure troubles of the bladder, is here of no use; nor, is distension of the bladder with fluid, which in case of a post-trigonal pouch, is always useful, of any avail where the stone lies in a post-prostatic pouch.

2. When there is reason to believe that there is a deep post prostatic pouch, it will be well, save in very exceptional cases, not to attempt lithotrity, for under such conditions it is likely to be impossible to clear the pouch of all vesical debris by instruments passed in through the urethra.

3. When calculous symptoms and vesical distress continue in spite of treatment, and no stone can be found by the usual methods of examination through the urethra, and also in cases where a stone is found, but lying deeply in a post-prostatic pouch, it is urged that the bladder should be opened by supra-pubic incision in preference to all others, for combined with firm upward rectal pressure, the surgeon thus obtains comand over the post-prostatic pouch such as can be obtained by no other cystotomy, while at the same time it is incomparably safer than any perineal operation, being almost bloodless in cases which by their very nature—great prostatic enlargement—are certain to bleed freely if any incision is made between the legs.

VII. Suprapubic Cystotomy and Excision of Vesical Papilloma. By MR. CRAVEN (Hull). A man, æt. 64, had suffered for four years from hæmaturia, with pain in the loins. The urine contained blood but no casts and the sound discovered no stone. Other organs were healthy. Neoplasm of the bladder being suspected, an

exploratory cystotomy was made and the finger in the bladder discovered a small growth on the left side of the fundus, near the opening of the left ureter, and possibly surrounding it, consisting of several nodules with a broad base of attachment. It was removed with the scissors, the wound partly closed and the bladder drained. Convalescence followed in about three months. The growth had the appearance of a simple adenoma.—*London Lancet*, Feb. 7, 1891.

VIII. **Suprapubic Lithotomy in China.** By SURGEON-MAJOR B. STEWART (Amoy). The author reports four cases:

1. A man, æt. 30, presented symptoms of a stone of large size, which could be plainly felt by manipulation between the abdominal wall and the rectum. Under chloroform, between eight and ten ounces of warm solution of boracic acid were injected into the bladder and the penis ligatured with a piece of india rubber tubing to retain the liquid. The bladder was thus distended above the pubes. An incision was extended upward from the symphyses four inches and the fascia and muscular fibres of the pyramidalis and the linea were carefully cut through to the full extent of the wound, then with fingers and handle of the scalpel, the glistening surface of the bladder was gradually exposed, the thin layer of peritoneum with the fat being scraped upward toward the top of the incision and held there by an assistant. The bladder, steadied by hooks, was now punctured near the upper portion of the skin wound with a sharp pointed bistoury, which was carried downward in a straight line toward the pubis. The opening being then found to be too small for the passage of the stone, it was enlarged upward and the calculus removed, measuring $2^1/_2$ by $2^3/_{16}$ by $1^5/_8$ inches in size and weighing 5 ounces and 40 grains. The bladder having been washed out with a weak solution of boracic acid, the wound was allowed to remain open and a soft rubber catheter placed in the bladder with the end hanging out at the pubic end of the wound, which was covered with a carbolized oil dressing changed twice a day. The patient recovered slowly because of the formation of a bedsore, but the catheter was removed from the wound and some urine passed by the urethra on the twelfth day and the bladder wound was treated on the thirtieth

Some months later the patient was found to have developed a ventral hernia at the upper part of the abdominal cicatrix.

2. A boy, æt. 7, had the bladder distended with a few ounces of boracic acid solution and the penis ligatured. An incision $2^1/_2$ inches long was made and the bladder reached as in the preceding case. The bladder was opened with a scalpel and forcibly enlarged with the fingers, giving passage to a rough stone, $1^1/_2$ by $1^1/_8$ by $^{11}/_{16}$ inch in size and 230 grains in weight, chiefly of uric acid. The wound was closed on the thirty eighth day and the cure complete three weeks later.

3. A youth, æt. 17, had removed in the same way as in the preceding cases a uric acid stone $1^3/_8$ by $1^1/_8$ by $^{11}/_{16}$ inch in size, and 242 grains in weight. The bladder was drained by means of a catheter tied in the urethra; it was removed, however on the third day on account of suspected irritation. The water was then allowed to drain from the wound, which was kept constantly smeared with boracic acid ointment to prevent excoriation. Ten days later a little urine passed by the urethra and the quantity increased daily until the twenty-ninth day when it all passed by the natural channel, the wound being completely healed on the thirty-eighth day.

4. A boy, æt. 6, had removed a uric acid stone $1^3/_{16}$ by $^3/_4$ by $^6/_{16}$ inch in size, weighing 77 grains. The straining of the patient in the effort to vomit forced out the peritoneum at the upper angle of the wound looking like a delicate thin bladder. The bladder, steadied by a loop of catgut, passed through the upper wall at its upper part, was opened and the stone readily extracted. The bladder was closed by sutures about $^1/_4$ inch apart through the muscular coat only and although a drainage tube remained in the wound urine passed freely by the urethra the next morning; there was nevertheless variable amount of leakage from the wound, which healed finally and completely in forty days.

In none of these cases was any attempt made to distend the rectum, yet in no case was there any great difficulty in reaching the bladder and the author believes that if care be taken, after dividing the skin, muscular fibres and fascia, to use the fingers and scalpel-handle in removing the cellular tissue and fat covering the vesical surface, there

is but little danger of wounding the peritoneum.—*Lancet*, December 13, 1890.

JAMES E. PILCHER (U. S. Army).

LYMPHATIC SYSTEM.

I. **Case of Rupture of Thoracic Duct. Death by Inanition at end of thirty-eight days.** By ALVIN EVER, M.D. (Cleveland). Male, æt. 28; thorax was squeezed between a railroad car and an engine; no fracture of ribs; but marks of external contusion resulted; traumatic pneumonia affecting right lung followed at once; during second day some gaseous distension of abdomen and hyper resonance of thorax, subsiding in great measure within thirty-six hours; on the seventeenth day a fluctuating swelling was detected in right inguinal region, which, on being opened, gave exit to much offensive gas and tœcal like liquid discharge After two or three days this discharge lost its offensiveness and became opaque and milky in character; rapid emaciation set in, the loss of body weight being estinated at above four pounds per day, and at the end of twenty-two days more, being the 38th from the occurrence of the injury he died from inanition despite persistent and intelligent efforts at both stomachic and rectal alimentation. On autopsy all the abdominal organs were found healthy; the right lung presented the appearence of pneumonia usual to that period of the disease; behind the right pleura was a cavity extending from the apex of the thorax to the diaphragm which had been formed by dissecting up the pleura, and which was full of fluid similar to that which had escaped from the inguinal fistula during life; about the aortic opening in the diaphragm there were evidences of recent inflammation which involved to some extent the adjacent portion of the liver and the œsophagus. Further careful search revealed an opening in the thoracic duct at the point where it passes through the aortic opening in the diaphragm. The location of this opening sufficed to explain the two different currents of extravasation which had occured.—*Med. Record*, Aug. 1, 1891.

HEAD AND NECK.

I. Absence of Pulsation in Perforating Fractures of the Skull. By PROF. PAUL BRAUN (Konigsberg). The author calls attention to the fact that in certain fractures, particularly in children, one or more of the fragments may be driven beneath the neighboring intact bony vault. In these cases there will be lacking the visible pulsation of the brain, although palpation will reveal its presence. The absence of pulsation is explained by the extreme tension to which the dura mater is subjected in order to accommodate the increased thickness of bony mass due to the displaced fragment. It is suggested that a similar condition would be present in subdural hæmorrhages or cerebral abscess. The fact is likewise mentioned that this symptom may be present in deep chloroform narcosis, without depression or displacement.

A case is reported by the author in illustration of the points set forth. —*Centbl. f. Chirg.*, 1890, No. 46

G. R. FOWLER (Brooklyn).

II. Congenital Occipital Meningocele treated by Ablation of the Sac; Recovery. By PROF. ANGELO MAZZUCCHELLI (Pavia, Italy). The writer presented a young child to the Medico-Chirurgical Socity of Pavia, which he had operated on for a small congenital tumor situated in the occipital region, which from its seat and symptomatology was diagnosticated as an occipital meningocele. The skin was incised over the tumor and two flaps formed. A ligature was applied to the pedicle and the tumor removed above the ligature; the skin flaps were then brought together and sutured. Union took place by first intention and recovery followed.—*Gaz. degl. Osp.* 1890, No. 89.

III. Resection of the Condyles for Ankylosis of the Lower Jaw. By DR. PALMIRO JEMOLI (Pavia). The writer describes the following case operated on by Prof. Bottini for complete ankylosis of the lower jaw, according to a method devised and succesfully employed by him in 1872. G. S., a tailoress, born of healthy parents, passed through an eventful infancy and childhood, suffering at eight

months from the whooping cough, at two from the measles and at eight from the scarlet fever. These diseases together with the insufficient nutrition which she received left her weak and slightly built. Although æt. 17, she had never menstruated. Her parents had already remarked at her 9th month, after the attack of pertussis, that she could only open her mouth to a slight degree; no physician was, however, then consulted, as it gave but little trouble. As soon as the child had arrived at dentition the teeth began to appear and the deformity became more striking. Several attempts were made to open the mouth by forcible dilation but with no success. On examination a complete ankylosis, with hypertrophy and sclerosis of the muscles, was discovered. The patient was prepared for operation, etherized and a straight incision four centimetres long was made one and a half centimetres in front of the auditory canal. The condyle was laid bare and found to have entirely grown to the glenoid cavity, there being no trace left of an articular cartilage. Instead of a chain-saw or bone forceps, the operator made use of a small scalpel, held like a chisel, with which and a wooden mallet he detached the condyle from the temporal bone and resected it. The wound was packed with sulpho-carbolate of zinc gauze and the operation repeated on the other side. The wound was dressed and drained. The patient's mouth was opened by a dilator and the muscles stretched; passive movements were made and the muscles exercised under chloroform anæsthesia until they had attained quite a degree of strength. One month after the operation the patient could open her mouth about four centimetres, eat the food of the hospital patients, consisting of meat, bread and soup; her speech had become perfectly normal. In place of the ankylosis pseudo-arthrosis had formed, which the operator hoped would be permanent, as the patient, seen over two months after the operation, could easily and painlessly chew any solid food; the movements of the jaw were also becoming freer.—*Gaz. degl. Osp.*, No. 11, 1891.

F. H. PRITCHARD (Boston)